
A Revision of *Sisymbriopsis* (Brassicaceae)

Ihsan A. Al-Shehbaz

Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A.

An Zhengxi

Herbarium, Biological Centre, August 1st Agricultural University, Urumqi, Xinjiang 830052,
People's Republic of China

Yang Guang

Piroche Plants, Inc., 20542 McNeil Road, Pitt Meadows, B.C., Canada V3Y 1Z1

ABSTRACT. The genus *Sisymbriopsis* is established, and a key, descriptions, and distributions of the five species are given. The new combinations *S. pamirica*, *S. shuanghuica*, and *S. yechengnica* are proposed.

During work on the Brassicaceae (Cruciferae) for the *Flora of China*, it became evident that the placement of many Chinese species fluctuated between different genera, and no clear lines have been drawn to delimit them. The present paper deals with the placement of four such species, plus a fifth endemic to Tajikistan.

In their original description of *Sisymbriopsis*, Botschantsev and Tzvelev (1961) recognized a single species, *S. schugnana* Botschantsev & Tzvelev, which was mistakenly treated and illustrated by Vasilczenko (1939) as *Torularia mollipila* (Maximowicz) O. E. Schulz. Botschantsev (1966) transferred the latter species to *Sisymbriopsis*, and subsequent works (e.g., Bondarenko, 1974; Czerepanov, 1995; Ikonnikov, 1979; Junussov, 1978) recognized only these two species. Although *S. mollipila* (Maximowicz) Botschantsev was originally described from Tibet (Maximowicz, 1889), Kuan's (1985) account of the family Cruciferae for the *Flora of Xizang* (Tibet) gave no mention of the species under any genus. By contrast, An (1987) reduced *S. mollipila* to synonymy of *T. mollipila*. He (An, 1991) placed *S. mollipila* in *Neotorularia* Hedge & J. Léonard (= *Torularia* O. E. Schulz (1924), not *Torularia* Bonnemaison (1828) of Rhodophyta) and recognized (An, 1995) some of its variants as members of the genera *Arabidopsis* (DC.) Heynhold and *Microsisymbrium* O. E. Schulz. Léonard (1986) excluded the species from *Neotorularia* and followed Botschantsev (1966) in assigning it to *Sisymbriopsis*.

The important points that need clarification are whether or not *Sisymbriopsis* should be recognized and whether *S. mollipila* should be kept in *Neoto-*

ularia. All species of *Neotorularia* have terete fruits, valves with a prominent or obscure midvein, typically incumbent cotyledons, and nectar glands consisting of lateral ones only. By contrast, all species of *Sisymbriopsis*, including *S. mollipila* and the others herein transferred to this genus, have flattened fruits somewhat rectangular in cross section, prominently 3-veined valves, obliquely accumbent cotyledons, and nectar glands consisting of median nectaries confluent with the lateral ones. In our opinion, these differences are of considerable significance, and they clearly support the recognition of *Sisymbriopsis* as independent from its nearest relative, *Neotorularia*.

Although Botschantsev and Tzvelev (1961) compared *Sisymbriopsis* with *Sisymbrium*, the two genera do not appear to be closely related. The presence in *Sisymbriopsis* of branched trichomes, obliquely accumbent cotyledons, and flattened fruits somewhat rectangular in cross section readily distinguish the genus from *Sisymbrium*, which has simple trichomes, incumbent cotyledons, and terete fruits. Although some of the southern African and South American species of *Sisymbrium* have branched trichomes (Marais, 1970; Romanczuk, 1982; Schulz, 1924), those species are anomalous in the genus and probably ought to be placed in other genera.

As delimited here, *Sisymbriopsis* includes five species, of which one, *S. schugnana*, is endemic to Tajikistan, three are endemic to China, and one occurs in both countries.

Sisymbriopsis Botschantsev & Tzvelev, Not. Syst. Herb. Inst. Bot. Acad. Sci. URSS 21: 143. 1961. TYPE: *Sisymbriopsis schugnana* Botschantsev & Tzvelev.

Herbs annual, biennial, or perennial. Trichomes stalked 1- or 2-forked to dendritic, sometimes

crisped or flattened, rarely exclusively simple. Stems erect to ascending, sometimes decumbent, simple or branched basally and/or apically. Basal leaves petiolate, pinnately lobed to coarsely dentate, rarely subentire. Cauline leaves petiolate or subsessile and not auriculate at base, entire, dentate, to pinnatifid. Inflorescences several-flowered, bracteate or ebracteate corymbose racemes, elongated slightly or considerably in fruit. Sepals oblong, erect, glabrous or pubescent, base of inner pair not saccate, margin membranous. Petals white or lavender, obovate, spatulate, or oblanceolate; claw usually obscurely distinct from blade. Stamens 6, slightly tetradynamous; filaments dilated or not dilated at base; anthers ovate or oblong, sagittate at base, obtuse or apiculate at apex. Nectar glands confluent and subtending bases of all stamens; median nectaries present; lateral nectaries annular. Fruit linear, flattened and latiseptate, appressed to rachis or not, sessile; valves papery, with a prominent midvein and 2 lateral veins and less prominent, anastomosing secondary veins, sparsely to densely pubescent with branched trichomes, rarely glabrescent or with simple hairs, somewhat rectangular in cross section, torulose; septum complete; style obsolete or short and less than 1 mm long; stigma capitate, entire or 2-lobed. Seeds uniseriate, wingless or distally with a small winglike appendage, oblong, slightly flattened; seed coat minutely reticulate, not mucilaginous when wetted; cotyledons obliquely accumbent.

- 1a. Trichomes simple, flattened; petals 6–10 × 3–5 mm 5. *S. yechengnica*
- 1b. At least some trichomes branched, not flattened; petals 2–4 × 0.6–1.5 mm.
 - 2a. Fruits secund; fruiting pedicels ascending to divaricate, 5–11 mm long; Tajikistan 1. *S. schugnana*
 - 2b. Fruits not secund; fruiting pedicels erect, appressed to rachis, 0.5–5(–6) mm long; China, Kyrgyzstan, Tajikistan.
 - 3a. Plants perennial; inflorescence bracteate; anthers not apiculate 4. *S. shuanghuica*
 - 3b. Plants annual; inflorescence ebracteate; anthers apiculate.
 - 4a. Fruit glabrescent or sparsely pubescent with crisped forked trichomes to 0.4 mm long; stigma subentire to slightly 2-lobed; fruiting pedicel stout; sepals sparsely pubescent with crisped forked trichomes 2. *S. mollipila*
 - 4b. Fruit densely villous with straight forked trichomes to 1 mm; stigma deeply 2-lobed; fruiting pedicels slender; sepals densely villous with straight simple trichomes 3. *S. pamirica*

1. *Sisymbriopsis schugnana* Botschantsev & Tzvelev, Not. Syst. Herb. Inst. Bot. Acad. Sci. URSS 21: 145. 1961. TYPE: Tajikistan. W Pamir, valley Murgab, 5–6 km below fl. W Pschart, ca. 3300 m, 22 June 1958, N. Tzvelev 256 (holotype, LE; isotype, LE).

Herbs biennial, 8–25 cm tall, densely canescent with a mixture of simple and 1- or 2-forked or subdendritic, short-stalked trichomes. Stems ascending to decumbent, branched primarily from or near base. Basal leaves rosulate, pinnatifid to pinnatisect; petiole (0.5–)1–2(–3) cm long, not ciliate; leaf blade oblong to oblanceolate in outline, (0.5–)1–3.5 cm long, (2–)5–10 mm wide, base cuneate, margin obtusely lobed, the lobes entire or few toothed, apex obtuse to rounded. Middle cauline leaves subsessile to short petiolate, similar to basal leaves but progressively reduced in size upward. Inflorescence ebracteate, rarely lowermost few flowers bracteate, elongated considerably in fruit. Pedicels in fruit ascending to divaricate-ascending, often secund, straight, slender, 3–8(–14) mm long, sparsely pubescent with branched trichomes. Sepals oblong, 2–3 × 1–1.5 mm, scarious at margin, pubescent with branched trichomes. Petals white to pink, spatulate to oblanceolate, 3–4 × 0.5–1.5 mm, attenuate to a clawlike base to 1.5 mm long, apex obtuse. Filaments white to lavender, 2.5–3 mm long; anthers ovate, 0.5–0.6 mm long, apiculate. Fruit (2–)2.5–3.5(–4) cm long, (1.5–)2–2.5 mm wide, divaricate, secund; valves sparsely pubescent with finely branched, crisped forked trichomes, rarely glabrescent; style 0.2–0.8 mm long; stigma subentire to slightly 2-lobed. Seeds yellowish brown, oblong, 1.4–1.8 × 0.7–1 mm, slightly compressed, distal margin sometimes with a minute wing; cotyledons obliquely accumbent. Flowering June–August, fruiting July–September.

Distribution. Endemic to Tajikistan at 3600–4500 m.

Specimens examined. TAJIKISTAN. **Pamir:** Gorno-Badakhshan, Sareszskoe Lake, valley of River Ramanf, 5 km from mouth, *Stanukovych et al.* 9743 (LE); Gorno-Badakhshan, River Topolovaya, *Stanukovych et al.* 8675 (LE); Gorno-Badakhshan, River Kazankul, 4 km from mouth, *Stanukovych et al.* 9422 (LE).

2. *Sisymbriopsis mollipila* (Maximowicz) Botschantsev, Novit. Syst. Pl. Vasc. 3: 122. 1966. *Sisymbrium mollipilum* Maximowicz, Fl. Tangut. 1: 62. 1889. *Neotorularia mollipila* (Maximowicz) Z. X. An, J. August 1st Agr. Coll. 14(2): 48. 1991. *Stenophragma mollipilum* (Maximowicz) B. Fedtschenko, Rastit. Turkest.

457. 1915. *Torularia mollipila* (Maximowicz) O. E. Schulz, Pflanzenreich IV 105(Heft 86): 217. 1924. TYPE: China. Tibet: Nan Shan, 11–12,000 ft., 23 July 1879, N. M. Przewalski s.n. (lectotype, designated by Vassilczenko (1939), LE; isolectotypes, LE, PE).

Arabidopsis qiranica Z. X. An, Fl. Xinjiang. 2(2): 376. 1995. Syn. nov. TYPE: China. Xinjiang: Qira Xian, 3100 m, 22 July 1981, *An Zhengxi* 88 (holotype, XJA).

Microsisymbrium taxkorganicum Z. X. An, Fl. Xinjiang. 2(2): 380. 1995. Syn. nov. TYPE: China. Xinjiang: Taxkorgan Xian, 3520 m, 4 July 1978, *Xinjiang Expedition* 958 (holotype, WUK).

Herbs annual or rarely biennial, (3–)18–45(–60) cm tall, densely to rarely sparsely covered basally with a mixture of simple and 1- or 2-forked, short-stalked trichomes, sparsely to moderately pubescent apically with crisped forked trichomes or rarely glabrescent. Stems erect, simple or sometimes branched at base. Basal leaves withered by fruiting time; petiole (0.5–)1–1.7(–3) cm long, strongly flattened at base, ciliate with simple trichomes to 1.5 mm long; leaf blade narrowly oblong to linear-lanceolate, (1–)2–4(–7) cm long, 2–8(–12) mm wide, base cuneate, margin coarsely dentate to pinnatifid, apex acuminate. Middle cauline leaves subsessile to short petiolate, linear to linear-lanceolate, 1.5–5(–8) cm long, 1–5(–10) mm wide, progressively reduced in size upward, margin entire to dentate, apex acuminate. Inflorescence ebracteate, elongated considerably in fruit. Pedicels in fruit erect, appressed to rachis, straight, stout, (0.5–)1–3(–4) mm long, sparsely pubescent with crisped, branched trichomes. Sepals oblong, (1.5–)2–2.5 × 0.8–1 mm, scarious at margin, sparsely pubescent with crisped branched trichomes. Petals white to lavender, oblanceolate, (2–)2.5–4 × (0.6–)0.9–1.2(–1.5) mm, attenuate to a clawlike base to 1.5 mm long, apex obtuse. Filaments white to lavender, (1.5–)2–3 mm long; anthers oblong to subovate, (0.3–)0.4–0.6 mm long, apiculate. Fruit (1.5–)3–5(–7) cm long, 1–1.2 mm wide, erect, appressed to rachis; valves sparsely pubescent with finely branched, crisped forked trichomes to 0.4 mm long, rarely glabrescent; style obsolete to 0.6 mm long; stigma subentire to slightly 2-lobed. Seeds yellowish brown, oblong, 0.9–1.4 × 0.6–1 mm, slightly compressed, distal margin sometimes with a minute wing; cotyledons obliquely accumbent. Flowering June–August, fruiting July–September.

Distribution and habitat. Afghanistan, China (Qinghai, Xinjiang, Xizang), Kyrgyzstan, Tajikistan. Exposed banks, gravelly steep slopes, flood land, alluvial plains, sandy or gravelly beaches, mountain

valleys, grassy slopes, *Juniperus* woods; 2900–4500 m.

Sisymbriopsis mollipila is reported here for the first time from Afghanistan. It has been collected extensively from Kyrgyzstan and Tajikistan, but only a few representative samples are cited from these two countries. It is the most widespread and variable species of the genus. Leaf size and margin, fruit length, and density of the indumentum on the upper parts, especially the fruit valve, are the most variable characters. However, the variation in these characters is continuous and can be found within the same population.

The types of *Arabidopsis qiranica* and *Microsisymbrium taxkorganicum* are short-fruited forms of *Sisymbriopsis mollipila*, with the former being glabrescent whereas the latter is moderately pubescent. Other features of both types are basically a perfect match with plants of *S. mollipila*.

Sisymbriopsis mollipila is most closely related to *S. pamirica*. Both species have erect fruits appressed to the rachis, small flowers to 4 mm long, and short pedicels rarely reaching 4 mm in length. However, they can be readily distinguished by their pedicels, stigmas, sepals, and type of trichomes on the fruit valves. *Sisymbriopsis mollipila* has stout pedicels, subentire to slightly 2-lobed stigmas, sepals and fruit valves sparsely pubescent with crisped, forked trichomes to 0.4 mm long, whereas *S. pamirica* has slender fruiting pedicels, deeply 2-lobed stigmas, sepals with straight simple trichomes, and fruit valves densely pubescent with straight, forked trichomes to 1 mm long.

Specimens examined. AFGHANISTAN. **Badakhshan:** Wakhan, NW Kol-e-Chaqmaqin, *Anders* 7567 (M). CHINA. **Qinghai:** Qagan Us river, C. Y. Wu, S. K. Chen, Du Qing & S. L. Lu 75-207 (HNWP); Delingha, Baishu Shan, B. Z. Guo & W. Y. Wang 11616 (HNWP); upper reach of Nomhon He, Du Qing 340 (HNWP); Qaidam, Dangshe Shan, *Qinghai-Gansu Expedition* 584 (PE), *Qinghai-Gansu Expedition* 602 (PE); Qaidam, Xilqou, *Qinghai-Gansu Expedition* 641 (PE); Qaidam, Dulan, *Qinghai-Gansu Expedition* 1681 (PE). **Xinjiang:** Yecheng Xian, *Qinghai-Xizang Expedition* 870863 (KUN), Y. H. Wu 1017 (HNWP); Ruoqiang Xian, Piaqiriketator, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 2152 (KUN, TI); Ruoqiang, N slope of Qimantag Mt., S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 2686 (TI); Qira, Nur, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 1986 (KUN, MO, TI); Qira Xian, Nur, Yamei, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 2530 (KUN, MO, TI); Yuitian Xian, Pulu Kanyan, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 3779 (TI); Yutian Xian, Pulu Sanchakou, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 3790 (HNWP, KUN, TI); Pishan Xian, Kaxtax Ruoqiang, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 3646 (HNWP, MO, TI), Y. H. Wu 3647 (HNWP); Taxkorgan Xian, B. S. Li, E. Zheng & B. P. Zhang 10496 (PE), G. L. Zhou (MO); Taxkorgan Xian, Hongqilapu, S. G. Wu, Y. H. Wu & Y. Fei 4872 (KUN, TI); 106 km S of Taxkorgan, *Kilim T-74* (XJA,

XJBI). **Xizang (Tibet):** Burchan Budda, 14 Apr. 1884, *Przewalski s.n.* (LE, P). KYRGYZSTAN. Semirechenskaya Range, River Aksay, 25 July 1903, *Lipsky s.n.* (LE); Narinsky Range, basin of River Aksay, *Sovetkina & Uspenskaya 1796* (LE); Prezwalski, River Kujandi, 30 July 1913, *Schischkin s.n.* (LE); Tian Shan, bank of River Ichiktor, 27 July 1960, *Kozshevnikova s.n.* (LE). TAJIKISTAN. Pamir & Tian Shan, 1906, *Appelton s.n.* (K); near Bordaba, *Alexeenko 2059* (LE).

3. *Sisymbriopsis pamirica* (Y. C. Lan & Z. X. An) Al-Shehbaz, Z. X. An & G. Yang, comb. nov. Basionym: *Arabis pamirica* Y. C. Lan & Z. X. An, Fl. Xinjiang. 2(2): 375. 1995. TYPE: China. Xinjiang: Taxkorgan Xian, 3700 m, 5 July 1978, *Xinjiang Expedition 1031* (holotype, WUK).

Herbs annual or? perennial, ca. 30 cm tall, densely villous throughout with straight, 1-forked, stalked and simple trichomes. Stems erect, branched at base and above. Basal leaves unknown; lower and middle cauline leaves short petiolate, lanceolate to oblong-lanceolate, 1–3 cm long, 4–10 mm wide, base cuneate, margin coarsely dentate to pinnatifid, apex acuminate. Inflorescence ebracteate, elongated considerably in fruit. Pedicels in fruit erect, appressed to rachis, straight, slender, 2–4 mm long, densely covered with simple and branched trichomes. Sepals oblong, 1.5–2 × ca. 0.5 mm, scarious at margin, densely pubescent with straight simple trichomes. Petals lavender, oblanceolate, 2–2.5 × ca. 0.7 mm, attenuate to base, apex obtuse. Filaments lavender, 1.2–2 mm long; anthers suboblong, ca. 0.5 mm long, minutely apiculate. Fruit 3–4.7 cm long, 1–1.1 mm wide, erect, appressed to rachis; valves densely villous with straight, stalked, forked trichomes to 1 mm long; style obsolete; stigma deeply 2-lobed. Seeds yellowish brown, oblong, 0.8–1 × 0.6–0.7 mm, slightly compressed; cotyledons obliquely accumbent. Flowering and fruiting July.

Distribution. Endemic to Xinjiang (China) and known only from the type, which was collected at ca. 3700 m.

The original description of *Arabis pamirica* (An, 1995) indicated that the type was collected in August rather than July, contrary to what the holotype label shows.

4. *Sisymbriopsis shuanghuica* (Kuan & Z. X. An) Al-Shehbaz, Z. X. An & G. Yang, comb. nov. Basionym: *Torularia shuanghuica* Kuan & Z. X. An, Fl. Xizang. 2: 404. 1985. TYPE: China. Xizang (Tibet): Shuanghu, 4950 m, 29 July 1976, *Lang Kai-yong 9891* (holotype, PE; isotypes, HNWP, KUN, PE).

Herbs perennial with a slender, simple or branched caudex, (5–)18–45(–60) cm tall, canescent, densely tomentose throughout with short-stalked, dendritic and fewer 2-forked trichomes. Stems erect to subdecumbent, branched basally and above. Basal leaves not rosulate; petiole 5–10 mm long, not flattened, ciliate at base; leaf blade spatulate to oblanceolate, 0.5–2 cm long, 1.5–5 mm wide, base cuneate, margin coarsely dentate to repand or entire, apex obtuse to subacute. Middle cauline leaves subsessile to short petiolate, similar to basal ones but progressively smaller upward. Inflorescence bracteate at least along lower half, elongated slightly in fruit. Pedicels in fruit erect, appressed to rachis, straight, slender, 3–5(–6) mm long, densely tomentose as rest of plant. Sepals oblong, 2–2.5 × ca. 1 mm, scarious at margin, densely pubescent. Petals white to lavender, spatulate, 2.5–3.5 × 0.9–1.5 mm, attenuate to a clawlike base to 1 mm long, apex obtuse. Filaments lavender, 2–3 mm long; anthers subovate, 0.4–0.5 mm long, not apiculate. Fruit 1.5–3 cm long, 1–1.3 mm wide, erect, appressed to rachis; valves densely pubescent with finely branched, short-stalked dendritic trichomes to 0.5 mm long; style to 0.5 mm long; stigma subentire to slightly 2-lobed. Seeds yellowish brown, oblong, 0.8–1 × 0.5–0.7 mm, slightly compressed; cotyledons obliquely accumbent. Flowering and fruiting July.

Distribution and habitat. Endemic to Xizang, China. Mountain slopes, sandy areas; 4800–4900 m.

Because of the limited collections available for this study, little can be said about the variability of *Sisymbriopsis shuanghuica*. This species and *S. mollipila* were placed in *Neotorularia* by An (1991), but the presence in both species of typically flattened fruits, strongly 3-veined valves, obliquely accumbent cotyledons, and median nectaries clearly support their placement in *Sisymbriopsis*. *Sisymbriopsis shuanghuica* differs from the remaining species of the genus on account of its perennial habit and bracteate inflorescences. However, these two characters alone do not carry much weight in the delimitation of genera in the family.

Two sheets at PE were marked as the type of *Sisymbriopsis shuanghuica*. The one carrying the PE number 1172825, which is the more complete, is taken here as the holotype, and that numbered 1172826 is annotated as the isotype.

Specimens examined. CHINA. **Xizang (Tibet):** Shuanghu, 4800 m, *Anonymous 11990* (PE).

5. ***Sisymbriopsis yechengnica*** (Z. X. An) Al-Shehbaz, Z. X. An & G. Yang, comb. nov. Basionym: *Microsisymbrium yechengnicum* Z. X. An, Bull. Bot. Res. North-East Forest. Inst. 1(1-2): 99. 1981. TYPE: China. Xinjiang: Yecheng Xian, Kunlun Shan, 1 July 1974, 3000 m, *Anonymous 3347* (holotype, HNWP; isotype, PE).

Herbs annual or perennial, 15–50 cm tall, glabrescent to sparsely pubescent with flattened, crisped, simple trichomes to 0.7 mm long. Stems erect to subdecumbent, simple or many-branched at base. Basal leaves withered by fruiting time, not rosulate; petiole 0.5–3 cm long, not flattened at base; leaf blade narrowly oblong to linear-lanceolate, 2–4 cm long, 1–5 mm wide, base cuneate, margin coarsely dentate to pinnatifid and lobes to 5×1 mm, rarely subentire, apex acuminate. Middle cauline leaves subsessile to petiolate, similar to basal leaves but progressively reduced in size upward, 3–7 cm \times 2–6 mm, margin entire to dentate, apex acuminate. Inflorescence ebracteate, elongated considerably in fruit. Pedicels in fruit divaricate to ascending, recurved to straight, slender, 0.7–1.8(–2.5) cm long, glabrescent or sparsely pubescent with crisped, simple trichomes. Sepals oblong, 3–4 \times 1.5–2 mm, scarious at margin, glabrous. Petals white to lavender, obovate, 6–10 \times 3–5 mm, cuneate to a claw 1–2 mm, apex obtuse. Filaments white, 2.5–3.5 mm; anthers narrowly oblong, 0.9–1.1 mm long, not apiculate. Fruit (1.5–)2.5–4 cm long, 1–1.2 mm wide, spreading; valves glabrescent, rarely sparsely pubescent with crisped simple trichomes to 0.5 mm long; style 0.4–0.6(–0.9) mm long; stigma entire. Seeds yellowish brown, oblong, 1.2–1.7 \times 0.8–1 mm, slightly compressed, distal margin with a minute wing; cotyledons obliquely accumbent. Flowering June–July, fruiting July–August.

Distribution and habitat. Endemic to Xinjiang, China. Grasslands, mountain slopes, sandy areas, steep rocky river banks; 2500–3000 m.

Two collections, *Wu et al. 1842* and *2410*, differ from the type collection and other examined specimens in being coarse perennials and many-branched at base (instead of smaller annuals and unbranched at base). Both collections do not have fully mature fruits, and they might represent an independent infraspecific taxon of *Sisymbriopsis yechengnica*. However, in their leaves, flowers, trichomes, and pedicel morphology they are indistinguishable from typical plants of the species.

Sisymbriopsis yechengnica is readily distinguished from the other species of the genus by its

simple, flattened, crisped trichomes and large petals 6–10 \times 3–5 mm. All other species of *Sisymbriopsis* have branched trichomes and petals 2–4 \times 0.6–1.5 mm. However, in all other characters, especially fruits, nectar glands, foliage, and cotyledonary position, *S. yechengnica* is perfectly at home in *Sisymbriopsis*.

Specimens examined. CHINA. **Xinjiang:** Pishan, Buzun, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 1842 (KUN, MO, TI); Pishan Xian, Naoarbat, S. G. Wu, H. Ohba, Y. H. Wu & Y. Fei 2410 (HNWP, KUN, MO, TI); 10 km N of Kalmakkuouk on Xinjiang–Xizang Hwy., *Anonymous 523* (KUN, PE); Yecheng Xian, *Qinghai-Xizang Expedition 870754* (KUN).

Acknowledgments. We are grateful to Tatiana Shulkina for her translation of some of the Russian literature and to Vladimir Dorofeev for his review of the manuscript.

Literature Cited

- An, Z. X. 1987. *Sisymbriaceae*. In: T. Y. Cheo (editor), *Fl. Reipubl. Popularis Sin.* 33: 396–453. Science Press, Beijing.
- . 1991. Emendation about plant names of *Neotorularia* Hedge et J. Léonard of Chinese Cruciferae. *J. August 1st Agr. Coll.* 14(2): 46–48.
- . 1995. *Cruciferae*. In: Z. M. Mao (editor), *Fl. Xinjiang*. 2(2): 38–229, 374–381. Xinjiang Science & Technology & Hygiene Publishing House, Urumqi.
- Bondarenko, O. N. 1974. *Sisymbriopsis*. In: A. I. Vvedensky (editor), *Conspectus florum Asiae Mediae* 4: 55. Academiae Scientiarum UzSSR, Tashkent.
- Botschantsev, V. 1966. *De Cruciferis notae criticae*, 5. *Nov. Syst. Pl. Vasc.* 3: 122–139.
- & N. Tzvelev. 1961. Genus novum *Sisymbriopsis* nob. e familia Cruciferae. *Not. Syst. Herb. Inst. Bot. Acad. Sci. URSS* 21: 143–145.
- Czerepanov, S. K. 1995. *Vascular Plants of Russia and Adjacent States (the Former USSR)*. Cambridge Univ. Press, Cambridge.
- Ikonnikov, S. S. 1979. *Definitorium Planarum Vascularium Badachschaniae*. Academy of Sciences, Leningrad.
- Junussov, S. J. 1978. *Sisymbriopsis*. In: P. O. Ovezinnikov (editor), *Fl. Tajikistan SSR* 5: 32–34. Academy of Sciences, Leningrad.
- Kuan, K. C. 1985. *Cruciferae*. In: C. Y. Wu (editor), *Fl. Xizang*. 2: 323–411. Science Press, Beijing.
- Léonard, J. 1986. *Neotorularia* Hedge & J. Léonard nom générique nouveau de Cruciferae. *Bull. Jard. Bot. Natl. Belgique* 56: 389–395.
- Marais, W. 1970. *Cruciferae*. In: L. E. Codd, B. de Winter, D. J. B. Killick & H. B. Rycroft (editors), *Fl. Southern Africa* 13: 1–118. Government Printer, Pretoria.
- Maximowicz, C. J. 1889. *Flora Tangutica*, Vol. 1. Imperial Academy of Sciences, St. Petersburg.
- Romanczuk, M. C. 1982. El género *Sisymbrium* (Cruciferae) en la Argentina. *Darwiniana* 24: 75–156.
- Schulz, O. E. 1924. *Cruciferae-Sisymbriaceae*. In: A. Engler (editor), *Pflanzenr.* IV 105(Heft 86): 1–388.
- Vassilczenko, I. T. 1939. *Torularia*. In: V. L. Komarov (editor), *Fl. URSS* 8: 59–69. Academiae Scientiarum URSS, Moscow & Leningrad.